Montana Fish, Wildlife & Parks

Draft Environmental Assessment

Control of the Aquatic Invasive Eurasian Watermilfoil

(*Myriophyllum spicatum*) within the

Canyon Ferry Wildlife Management Area, Broadwater County, Montana

March 2019

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1. INTRODUCTION

1.1 Background

Eurasian watermilfoil (*Myriophyllum spicatum*) was first discovered in Montana in 2007 in Noxon Rapids Reservoir. In 2010, several new infestations of Eurasian watermilfoil (EWM) were identified throughout the state including Fort Peck Reservoir, Toston Reservoir, Jefferson River, upper Missouri River, and Canyon Ferry Wildlife Management Area.

Eurasian watermilfoil is an invasive aquatic plant that is non-native to the U.S. It is listed on the Montana Noxious Weed List as a priority 2B species, and as such, landowners have the responsibility to control said species on their property. Eurasian watermilfoil and other aquatic invasive plants can pose an environmental and economic risk to Montana. Early detection and control are vital to control or eradicate EWM. A previous environmental assessment regarding control of EWM on the Canyon Ferry Wildlife Management Area was done by FWP in 2014 (MFWP 2014). There is a need to do another EA since the previous EA only covered the 2014-2018 time period.

1.2 Project Location

Canyon Ferry Wildlife Management Area (CFWMA) is located in Broadwater County, just north of the town of Townsend. The majority of the WMA is administered by the Bureau of Reclamation (BOR) but is managed by Montana Department of Fish, Wildlife, and Parks (MDFWP) through a long-term Cooperative Management Agreement with the BOR.

Figure 1. Canyon Ferry WMA location.

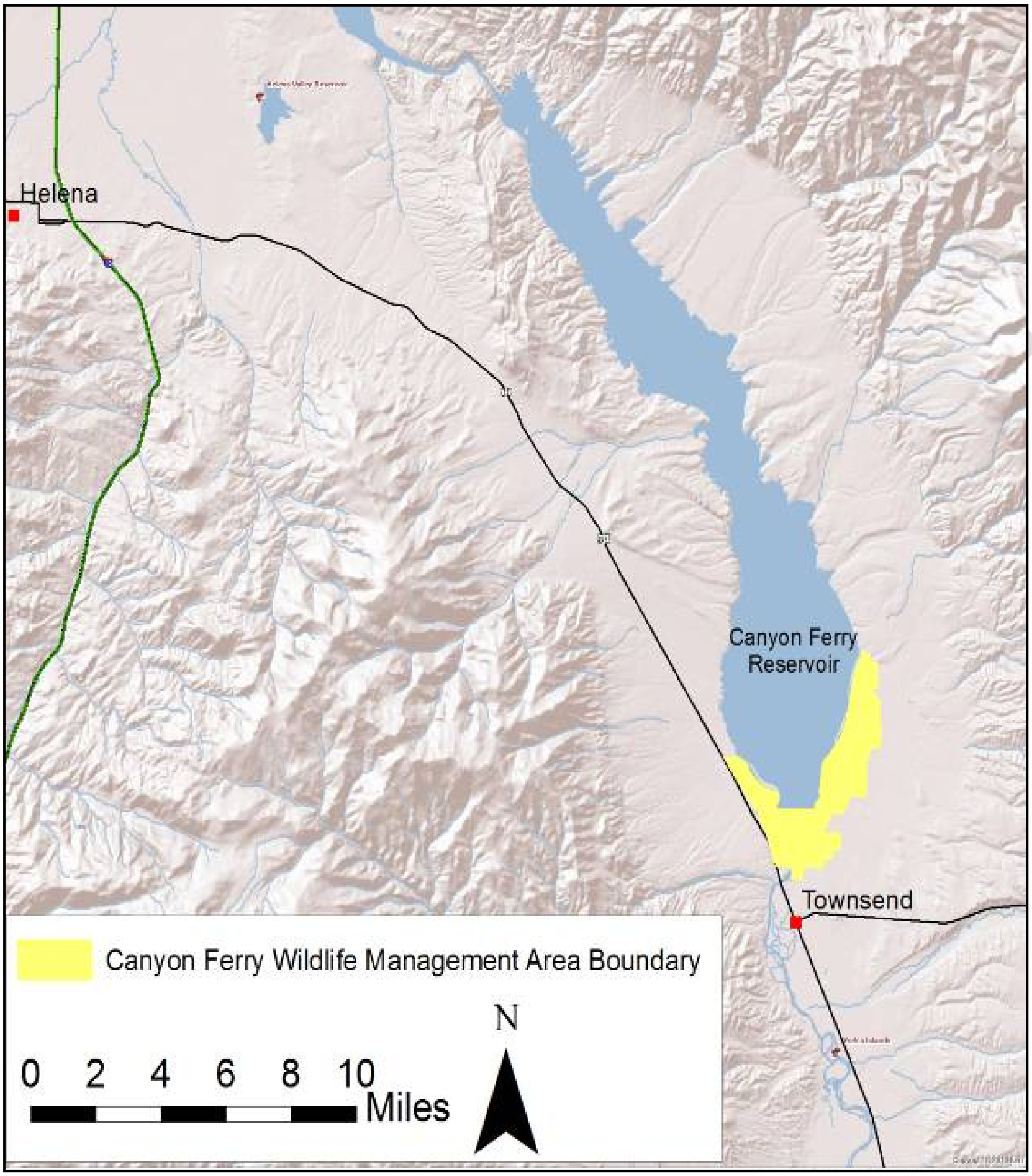

Figure 2. Aerial photo of lower end of Canyon Ferry WMA showing east and west canals.

Canyon Ferry WMA is approximately 5,100 acres in size and is adjacent to the south end of Canyon Ferry Reservoir. In addition to the two canals that provide water to the CFWMA's duck ponds, the management area also contains a river delta of the Missouri River at the inlet to the reservoir. The area is a typical river delta with many braided channels and backwaters of the Missouri River that provide many suitable areas for the establishment of EWM.

1.3 Previous Aquatic Invasive Control Efforts

Since the confirmation of EWM on the Canyon Ferry WMA in 2010, management area staff and volunteers have worked to suppress known infestations. Previous efforts have included periodic hand-pulls (2010-2015) in the Cottonwood Channel and/or in the area around the Cottonwood Channel boat ramp.

In 2013, FWP worked with Montana Conservation Corps (MCC) members to hand-pull EWM within the West Canal. The canal is 1.7 miles long with steady width and grade. The crew consisting of MCC, FWP, Bureau of Reclamation staff, and other volunteers spent 5 days and removed 7,175 pounds of EWM (over 400 worker hours) while only covering .93 miles. It was determined that manual removal of EWM was not a viable future option to suppress EWM in the west canal. The same would be true of the east canal given that approximately 3.82 miles of canal would have to be treated.

Aquatic herbicide applications for EWM have been done in the west canal since 2014 (2014-2018) using a mixture of Cascade (Endothal) and Renovate 3 (Triclopyr) herbicides. Sampling done 9 months post-treatment of the initial aquatic herbicide treatment in the fall of 2014 indicated effective control results on EWM. Sampling done 6 weeks post-treatment in August 2018 indicated continued presence of EWM at varying levels in the west canal and that EWM was also now present at various levels in the east canal. The aquatic herbicide applications have also targeted curlyleaf pondweed (*Potamogeton crispus*) in both canals since 2016. However, since EWM was not known to be present in the east canal until the summer of 2018, only Endothal (contact herbicide that has some effect on EWM) has been used in the east canal (2016 – 2018).

2 PURPOSE AND NEED

2.1 Proposed Action

The purpose of the proposed action is to continue to allow aquatic herbicide control of EWM within the west canal and east canals on the CFWMA. If EWM spreads and becomes a problem in the CFWMA duck ponds), then there might be a need for aquatic herbicidal control of EWM in the applicable duck ponds in the future. The west canal supplies the water to Pond 4 and the east canal supplies the water to Ponds 2 and 3. This environmental assessment evaluates two alternatives, which includes a No Action Alternative – no aquatic herbicidal control, and the preferred alternative that utilizes aquatic herbicidal chemical control. Under the preferred alternative, it's expected that aquatic herbicide applications for EWM would likely have to continue indefinitely in the two canals given the steady input of EWM plant propagules from the Missouri River. EWM is found in many upstream areas of the Missouri and Jefferson River watersheds. Any high-flow event could result in EWM levels returning to pre-treatment levels or result in levels higher.

FWP's previous EAs on control of EWM (2014) and curlyleaf pondweed (2016) on the CFWMA evaluated and determined that the use of non-herbicidal control options to control aquatic invasives in the CFWMA's canal system either aren't viable and/or would have limited effectiveness and as such those options will not be reevaluated.

2.2 Object of the Proposed Action

Given that EWM is a state listed noxious weed, FWP is required by law to make efforts to control the species. The proposed action would work to control and reduce the amount of EWM in the two canals, and thereby reduce the potential for spreading EWM to other locations on the Canyon Ferry WMA via hunter activities. Again, it is unlikely that control efforts will eradicate EWM from Canyon Ferry WMA, as upstream populations will continue to provide plant propagules, but reductions in overall abundance will benefit native ecosystems.

2.3 Authorities and Relevant Documents

2.3.1 Authorities

Most of the Canyon Ferry WMA is administered by the Bureau of Reclamation (FWP owns approximately 129 acres). Montana Fish, Wildlife & Park's manages the CFWMA through a long-term management agreement (No. R12MU60088, 2012) with the Bureau of Reclamation.

A Montana Discharge Elimination Permit (MPDES) is required to apply any pesticide in or over waters of the state. This permit is a pesticide discharge permit that allows the recipient to temporarily exceed tolerances established by the Montana Department of Environmental Quality. FWP will obtain this permit prior to any herbicide application.

2.3.2 Relevant Documents

Under the new Canyon Ferry Wildlife Management Area Draft Management Plan (Grove 2019), one of the listed objectives on the CFWMA is control of noxious weeds. Control strategies will follow Montana's Statewide Strategic Plan for Invasive Plant Management and Resource Protection (MNWSAC 2011). This plan provides best strategies for monitoring and managing aquatic invasive plants.

2.4 Environmental Assessment Scope

Based on the EA that was written for the control of Eurasian watermilfoil on the CFWMA in 2014 (MDFWP, 2014), the following issues were identified to evaluate within the scope of this EA:

- Fish (including species of concern)
- Wildlife (including species of concern)
  - Migratory Birds
  - Mammals
  - Reptiles and amphibians
  - Mussels & Macroinvertebrates
- Vegetation
- Environmental
  - Water quality
  - Air quality
  - Sediments
  - Wetlands
- Recreation
- Human Health

3. ALTERNATIVES

3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no continuation of EWM aquatic herbicidal control within the two canal systems on the CFWMA. EWM would increase in the canal systems and likely spread to ponds 2, 3 and 4 which could increase the possibility of it spreading to other waterways and/or waterbodies elsewhere including potentially Canyon Ferry Reservoir. An increase in EWM would negatively impact the presence of native aquatic vegetation species within the canal system and the duck ponds, if EWM were to spread to them. The No Action Alternative is not a viable alternative because Montana statute requires FWP to control noxious weeds on its properties. The presence of

EWM has the potential to negatively impact recreation, water quality, irrigation, fish and wildlife species, and the habitat upon which they depend.

3.2 Alternative 2 - Preferred Alternative: Utilize Aquatic Herbicidal Control

Under this alternative, FWP would continue to do aquatic herbicide applications in the two canals within the CFWMA (and within the duck ponds if necessary and desired) on an annual basis. A combination of the two herbicides selected as a result of the 2014 EWM EA (Endothall and Triclopyr) would be applied in the two canals by a licensed aquatic applicator during the time period when EWM is actively growing which typically occurs from June through September. Curlyleaf pondweed in the canals would also continue to be treated via aquatic herbicide applications either simultaneously with EWM or separately if needed to better control the two aquatic invasives.

3.2.1 Herbicides

Aquatic herbicides are applied as concentrated liquids, granules, or pellets. Liquid herbicide formulations are applied to the entire water column to control the submersed weeds, and granular and pellet products are applied using granular spreaders and target the water column with vegetative growth. Aquatic herbicide applicators calculate the volume of the water to be treated before applying aquatic herbicides to ensure that the appropriate amount of herbicide is used.

Like herbicides used in terrestrial systems, there are contact and systemic herbicides. Contact herbicides are the group of herbicides that result in the rapid injury or death of contacted plant tissues and lack mobility within plant tissues once taken into the plant tissue. Contact herbicides can be used to temporarily control aquatic plants such as EWM (or CLP). These treatments are often initially effective but treating large plants with a contact herbicide commonly leads to rapid recovery and re-growth from plant tissues that are not exposed to the herbicide. As a result, multiple applications of contact herbicides over several years are often needed to reduce populations as reserves get used up and new growth from turions are killed before development of new turions. For some aquatic invasive species such as EWM, systemic products have been utilized to control emergent plants (SCE, 2010). Systemic herbicides are mobile in plant tissue and move through the plant's water-conducting vessels (xylem) or food-transporting vessels (phloem). Once the herbicide is absorbed into the plant, it can move through one or both vessels and throughout the plant tissue to affect all portions of the plant, including underground roots and rhizomes.

3.2.1.1 Herbicides Selected for EWM Control

3.2.1.1.1 Endothall

Endothall is used primarily to control submersed plants and use rates and methods of application vary substantially. Two forms of endothall are available: dipotassium salt and monoamine salts. The monoamine salts are more toxic to aquatic life and will not be used in the CFWMA canal system. Only Endothall in the form of dipotassium salts will be used in the CFWMA canal system (and/or ponds if that need were to arise). Levels >100 grams of active ingredient for the dipotassium salts (WSDE 2010) are required for fish toxicity which is far, far above levels that would be used during application. This low toxicity for dipotassium salts makes this contact herbicide widely used in the US. For quiescent or slow-moving water, there may be approximately 7 days restriction for water uses including animal consumption, but in flowing water treatments such as in the two canals, there are no restrictions for swimming, fishing, livestock watering, and turf irrigation. The effectiveness of Endothall is not affected by factors such as alkalinity or turbidity of the water.

3.2.1.1.2 Triclopyr

Triclopyr was registered for aquatic use in 2002, and a major use of this herbicide has been for selective control of EWM. Triclopyr does not control desirable native species like rushes (*Juncales* spp. and *Scirpus* spp.), cattails (*Typha* spp.), duckweed (*Lemna* spp.), flatstem pondweed (*Potamogeton zosteriformis*), coontail (*Ceratophyllum demersum*), Southern naiad (*Najas guadalupensis*), elodea (*Elodea Canadensis*), and most species of algae, including the green algae (*Spirogyra* spp., *Cladophora* spp., *Mougeotia* spp. *Volvox* spp., *Closterium* spp. and *Scenedesmus* spp.), *Chara* spp. and *Anabaena* spp. (Getsingeret et al, 2000; Woodburn et al, 1993; Petty et al, 1998 and Green et al, 1989, Foster et al, 1997, Woodburn, 1988 and Houtman, 1997). There may be some sensitive native plant species that are susceptible to Triclopyr, but normally not at typical application concentration of 2.5ppm or less. Higher concentration levels can affect species such as southern naiad, elodea, and coontail (WSDE 2004).

Triclopyr is registered as both liquid and granular amine formulations. Triclopyr is approved to be used in non-irrigation canals such as the two on the CFWMA but not labeled for use in un-impounded rivers such as the Missouri River and associated side channels. To achieve the necessary effective contact time and concentration levels, flow through the ditch will be restricted for 24 to 48 hours and water levels reduced to a minimum. The flow rate will be measured and the area/volume to be treated will be estimated once the water levels have reached the minimum. These calculations will determine the concentration and application time for a metered dose system.

The most likely method of applying Triclopyr and Endothall will be to pump herbicide into the head of the canal using a metered chemical injection system. The herbicides will be applied at the rate/time needed to achieve the necessary contact time. Once the application has been completed, flow rates will be returned to normal, effectively diluting any remaining herbicides.

Other aquatic chemicals were evaluated as part of the 2014 EWM EA or have been subsequently looked at and not deemed to be viable options given the constraints of the system and concerns for potential impacts to fish and wildlife resources. However, other chemicals could be used as they become available or as new science shows that they are safe regarding potential fish and wildlife impacts and are effective in controlling EWM.

4. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 Fisheries

4.1.1 Affected Environment

Canyon Ferry Reservoir and the Missouri River prior to entering the reservoir are home to many different species of fishes. Native species include burbot, longnose dace, longnose sucker, mottled sculpin, mountain whitefish, stonecat, westslope cutthroat trout, and white sucker. Intentionally introduced species include brook trout, brown trout, rainbow trout, common carp, fathead minnow, flathead chub, largemouth bass, smallmouth bass, and yellow perch. Illegally introduced species include northern pike, Utah chub, and walleye (FWP MFISH, 2014). Although these species occasionally enter the canals, many fish are lost to the system when entering the canal system. Pond 2, 3 & 4 which are provided water by either the east or west can experience minimal connectivity with Canyon Ferry Reservoir but can see some of these species. High turbidity levels occur in the ponds when carp populations in the ponds are at high levels and as such, other species are typically less abundant. The canals typically contain very few fish, but stonecats, carp, suckers, and minnow species are found scattered within the canals.

Threatened, Endangered, and Sensitive Fish Species
The westslope cutthroat trout is one of two cutthroat trout subspecies in Montana. Most genetically pure populations are in headwater streams. Westslope cutthroat trout are extremely rare in Canyon Ferry Reservoir with data only existing from a single sample collected in the reservoir (MT FWP MFISH data 2014) and are not likely to be found in the canals. As such, the likelihood of a westslope cutthroat trout being impacted by the proposed activity is extremely unlikely.

4.1.2 Environmental Consequences of Alternative 1: No Action Alternative
Direct and Indirect Effects
With the No Action Alternative, no control work will occur on EWM. As such, what fish habitat there was in the canals and the ponds would likely continue to degrade within Canyon Ferry WMA, as EWM rapidly displaces native vegetation.

Cumulative Effects
The cumulative effects would likely include expansion of EWM within Canyon Ferry WMA and increased risk of EWM being moved to other locations by human dispersal.

Threatened, Endangered, and Sensitive Fish Species
The No Action Alternative will not actively protect these species. Further declines in populations could occur with loss of native ecosystems with novel ecosystems with the existence of EWM.

4.1.3 Environmental Consequences of Alternative 2
The proposed herbicides in this project are those herbicides that are labeled to be used or will be effective in this environment, have been registered by both the EPA and Montana Department of Agriculture, and have been deemed safe if applicators follow the manufacturer's label during application. The applications for EWM will occur once per year, and exposure times will be short (less than 24 hours).

Direct and Indirect Effects
<u>Endothall</u>
No negative effects have been shown to survival, growth, or reproduction of some warm water fishes including bluegill and largemouth bass over a two-year period when exposed to dipotassium salt of endothall. Rainbow trout is one of the most sensitive fish species in the project area. Empirical tests show that the there is no impact to this species with endothall levels below 5mg a.i./L (maximum-labeled rate). Even when endothall is used at a high rate of 3.5 mg a.i./L, no impact to fish are expected (WSDE, 2001).

<u>Triclopyr</u>
Most fish species are not sensitive to Triclopyr at application rates. Sensitive species such as various salmon species have demonstrated LC50's (concentration that is lethal to 50% of the population) between 96 and 182 mg a.i./L (WSDE, 2010). Rainbow trout species have an LC50 of 117 mg a.i./L (toxicity rating of practically non-toxic), and bluegill, which are commonly used to test toxicity to warm water fishes have an LC50 of 148 mg a.i./L (toxicity rating practically nontoxic) (WSDE, 2004). Risk

assessments indicate that triclopyr may be used safely at concentrations up to 2.5 mg a.i./L (maximum labeled rate) when most species of fish and invertebrates are present (WSDE, 2010). The 96-hour LC50 for all verified studies on fish is greater than 82 mg a.i./L. This level is equivalent to a risk quotient for the most sensitive species (rainbow trout) of 0.03. This is below acute levels of concern (0.1) (WSDE, 2010). A study has shown that death of fish that occur during the use of triclopyr is low (<11%) and likely linked to reductions in oxygen levels due to rapid growth of native plant species (Petty et al, 1998)

The applicators will strictly adhere to all herbicide labels and manufacturer's recommendations. In addition, exposure times will be short and repeat applications of at least Triclopyr are not expected (a separate application of Endothall just for control of CLP at a different time could potentially be done). Therefore, fish within the project area would not be impacted directly by the proposed herbicide applications. Maximum label rates are 5 mg/L endothall, and 2.5 mg/L Triclopyr, but lower rates are expected to be used since lower levels should kill EWM plants and meet project objectives while reducing potential risks to non-target plant species and fish species and wildlife. As the treatment will occur in flowing water systems, herbicide dissipation will be rapid lasting a few hours to days. Dilution will occur once the chemical enters ponds 2 or 3 in the case of the east canal or pond 4 in the case of the west canal. In addition, flows could be increased temporarily to expedite dissipation after the treatment is complete. This dilution and dissipation will help return herbicide levels back down to levels within the water quality standards. All these factors will reduce the risk to fisheries and will not pose any considerable risk.

When plants begin to decompose after herbicide treatments, there is often a drop in dissolved oxygen levels. These reductions can be fatal to fish species in situations with little water exchange. The moving water through the canals will increase dissolved oxygen. Changes in other nutrients may occur during plant decomposition, but these temporary impacts will be quickly diluted, and levels will stabilize with fresh water upstream and the additional large volume of water in the ponds.

Cumulative Effects

Endothall is unlikely to pose a risk of bioaccumulation in fish, and as applications would typically occur at the most twice a year (if a separate application for CLP was done) the risk of bioaccumulation is further reduced (WSDE, 2010). Post treatments surveys of EWM by FWP staff performed one year after treatment will determine the continuing effectiveness of this treatment option and will be used to monitor levels of EWM (& CLP) in the canal system.

Threatened, Endangered, and Sensitive Fish Species

The proposed action would not pose additional impacts to sensitive fish species within the project area. Direct and indirect impacts are the same as those discussed above. The proposed action would have no net effect on threatened or endangered fish within the project area. Though unlikely, some sensitive fish species may temporarily be displaced due to the proposed action, but that displacement would be temporary, and the viability of their populations would not be impacted.

4.2 Wildlife

4.2.1 Affected Environment

The primary goal of Canyon Ferry WMA is to provide productive habitat for the diversity of wildlife species that utilize the area and provide for consumptive and non-consumptive use of those resources (Grove 2019).

Migratory Birds

Canyon Ferry WMA is used by migratory birds as well as year-round resident birds. A total of over two hundred bird species have been observed on the Canyon Ferry WMA (Martinka 2005 – updated 2016). The water resources on this management area are vital for the reproductive and migratory success of many of the species of birds found on the management area. Four artificial ponds were constructed in the 1970's to enhance waterfowl production and reduce air quality problems due to wind-caused dust storms near the Canyon Ferry delta, and these ponds provide valuable nesting habitat. The ponds can be relatively turbid due to carp activity when carp levels are high which can limit aquatic vegetation (including EWM). However, water management drawdowns were recently done in ponds 4 (2015) and 3 (2017) that resulted in carp being temporarily eliminated from those ponds resulting in improved water clarity. The improved water clarity will benefit aquatic vegetation growth including potentially EWM. However, carp will recolonize the ponds via the canals, and water clarity will decline over time as carp numbers increase. The management area also supports wild populations of ring-necked pheasant, Hungarian partridge, and turkeys.

Mammals

A wide variety of mammals are found on the management area including large mammals such as moose, white-tailed deer, mule deer, antelope, coyotes, occasional black bears and mountain lions. Smaller mammals include bobcat, fox, raccoons, beaver, mink, muskrats, skunks, rabbits, and rodents.

Reptiles and amphibians

Common reptile and amphibians found within Canyon Ferry WMA include the painted turtle, gopher snake (bullsnake), common garter snake, terrestrial garter snake, eastern racer, rubber boa, prairie rattlesnake (rare), western toad, Columbia spotted frog, and leopard frog (Grove 2019). There are no known species of concern with the management area.

Mussels & Macroinvertebrates

Macroinvertebrates found within the project would be those species typically found in a ditch or small, slow moving water body. A spring snail is a species of concern within the management area but is found in a spring outside the project area.

Threatened, Endangered, or Sensitive Species of Concern

The Montana Natural Heritage Program tracks the distributions and sightings of federally and state listed species of concern. Information provided from them identified 11 animal species of concern. These species include Clark's grebe, American white pelican, great blue heron, bald eagle, long-billed curlew, Caspian tern, common tern, Clark's nutcracker, veery, bobolink, and a spring snail. All these species are avian species with exception of the spring snail that is only found in springs outside the project area. Most of these bird species also utilize aquatic environments for foraging, breeding, or migratory habitat. This list of species includes a mile buffer from the project area to ensure no other species of concern in the area may utilize the project area.

4.2.2 Environmental Consequences of Alternative 1: No Action Alternative
The No Action Alternative would not actively manage EWM. It is likely that EWM would continue to spread in acreage and in density. This would likely have cascading effects on native aquatic plant communities which could negatively affect many different animals that rely on those native aquatic plant communities. Some species may benefit from the increase in EWM if they are able to exploit it for food or shelter, while other species abundance may diminish. These unknown cascading effects could also extend into surrounding terrestrial ecosystems since aquatic ecosystems provide resources to other ecosystems.

Threatened, Endangered, or Sensitive Species of Concern
No specific differences exist between species of concern and other species potentially using the project area. Some species may benefit from the increase in EWM if they are able to exploit it for food or shelter, while other species abundance may diminish. These unknown cascading effects could also extend into surrounding terrestrial ecosystems since aquatic ecosystems provide resources to other ecosystems.

4.2.3 Environmental Consequences of Alternative 2
Direct and Indirect Effects
Studies show low toxicity to endothall to the aquatic invertebrate species, *Daphnia magna*, a common test species, when maximum application rate is applied. No adverse impacts have been seen to Cladocerans, Copepoda, and Calanoida. In addition, no adverse direct effects or indirect effects, like reductions in dissolved oxygen, have been noted in free-swimming species. Benthic invertebrates display similar characteristics with low acute toxicity (WSDE 2010). Application of Endothall at the label rates will not adversely affect any macroinvertebrates.

Studies show that triclopyr and its associated chemicals after breakdown are non-toxic to aquatic invertebrates (e.g. *Daphnia magna*, crayfish, benthic community) and likely do not pose chronic risks since the half-life is short (<5 days) and the chemicals quickly disappear from the water column. Higher concentrations around the maximum-labeled rate (2.5 mg a.i/L) present a low to moderate risk. Field trials in control of EWM, purple loosestrife, or water hyacinth show no invertebrate mortality or changes in populations that could be attributed to Triclopyr use. (Petty et al 1998, Green et al 1989, and Gardner and Grue 1996, Houtman et al 1997, Foster et al 1997, Woodburn 1988).

Little is known on the effects of Triclopyr to amphibians, but it is anticipated that amphibians would be affected by Triclopyr similar to fish species. As such, there is likely no adverse from the herbicides at the suggested application rates (WSDE 2004).

Avian/birds toxicity studies indicate that triclopyr and its products used as aquatic herbicides do not pose an acute or chronic risk to wild birds (WSDE 2010). Mallard Ducks have an LC50 of 50mg a.i./L for endothall, which is nearly ten times the maximum-labeled rate (WSDE 2001).

Wildlife could be exposed to chemicals through treated water they use as drinking water or consuming aquatic organisms exposed to the chemicals. Based on acute and chronic studies the proposed chemicals do not pose any significant risks (WSDE 2010; WSDE 2004). Exposure risk is minimal due to the short exposure time, fresh water exchange from upstream, and dissipation into the ponds. In addition, there is a low tendency for bioaccumulation for either herbicide (WDSE 2010; WSDE 2004).

Threatened, Endangered, or Sensitive Species
The proposed action may pose short-term impacts to threatened, endangered, and sensitive wildlife species within the project area. The direct and indirect impacts are the same as those discussed above.

Cumulative Effects
It is expected that control of EWM would improve aquatic habitat and improve biodiversity. Recreationists will continue using the area with lower risk of spreading EWM to other areas. Cumulative effects of the proposal are unlikely to be significant.

4.3 Native Vegetation

4.3.1 Affected Environment

Within the project area where the treatment will occur, typical native aquatic plants are found as well as riparian plants along the waters' edge. Grasses, mostly reed canarygrass (*Phalaris arundinacea*), dominate the edges of the canals. There are no plant species of concern in the project area.

4.3.2 Environmental Consequences of Alternative 1: No Action Alternative

Under the No Action Alternative, it is likely that EWM would continue to spread in acreage and in density. This would likely have cascading effects on native aquatic plant communities. Eurasian watermilfoil may utilize habitat typically occupied by native aquatic plant species, which could result in system scale reductions in the native plant community.

4.3.3 Environmental Consequences of Alternative 2

Direct and indirect effects
Triclopyr does not control desirable native species like rushes (*Juncus* spp. and *Scirpus* spp., etc), cattails (*Typha* spp.), duckweed (*Lemna* spp.), flatstem pondweed (*Potamogeton zosteriformis*), coontail (*Ceratophyllum demersum*), southern naiad (*Najas guadalupensis*), elodea (*Elodea Canadensis*), and most species of algae, including the green algae (*Spirogyra* spp., *Cladophora* spp., *Mougeotia* spp. *Volvox* spp., *Closterium* spp. and *Scenedesmus* spp.), *Chara* spp. and *Anabaena* spp. (Getsingeret et al 2000; Woodburn et al 1993; Petty et al 1998 and Green et al 1989, Foster et al 1997, Woodburn 1988, and Houtman 1997). There may be some sensitive native plant species that are susceptible to Triclopyr, but normally not at typical application concentration of 2.5ppm or less. Higher concentration levels can affect species such as southern naiad, elodea, and coontail (WSDE 2004).

Endothall is a non-selective contact herbicide, so some native plant species may be impacted when exposed to higher levels of Endothall. Endothall will only kill parts of plants exposed to the chemical, so only the stems and leaves of plants would be killed with endothall. Therefore, short-term damage to native plant species within the canal could be seen but should be short lived, and plants should recover in subsequent seasons. However, within the area that is being treated with herbicide, very few native plants exist because EWM covers most of the suitable substrate for plant growth. The dilution that occurs when the water from the canal enters the pond will reduce chemical levels in the pond to levels that will not affect plant communities.

Cumulative effects

Alternative 2 would hopefully control and reduce the amount of EWM in the canals which could allow native plants to colonize exposed substrates. While EWM would likely re-establish from upstream sources, native plants would also, so the overall impact from EWM would hopefully be reduced.

4.4 Water Quality

4.4.1 Affected Environment

The proposed action would treat the two canals that provide water to ponds 2 and 3 (east canal) and pond 4 (west canal). If EWM were to spread into one of the three ponds that get their water from one of the canals, it might be necessary to treat it with aquatic herbicide in the future. However, as periodic management water drawdowns are done in the ponds to control carp numbers and to aerate the oxygen depleted substrates, it's unlikely that an aquatic herbicide application would need to be done in a pond. In addition, as mentioned previously, increased carp numbers in the ponds leads to increased water turbidity in the ponds which precludes growth of EWM. The canals do not serve as a water source for irrigation. The canals and ponds are not used for drinking water by livestock, though wildlife such as deer and moose may use them as a water source.

4.4.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct or Indirect Effects

Under the No Action Alternative, EWM infestations would persist and likely spread. No chemicals would be used, so the associated risks with those would be eliminated. However, water quality could degrade through dissolved oxygen depletion due to decomposition of large EWM beds.

Cumulative Effects

Under the No Action Alternative, EWM infestations would persist and could potentially spread into the ponds and could be spread into other water bodies including into Canyon Ferry Reservoir through human activities. This spread could lead to additional localized dissolved oxygen depletion in those water bodies.

4.4.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

The direct and indirect effects resulting from Alternative 2 only include short-term impacts. All chemical applications will follow all label restrictions and application rates specified by the manufacturer. As recommended rates will exceed water quality standards, a Montana Discharge Elimination Permit would be obtained prior to application.

Endothall is stable in pure water, at a pH of 7 has a half-life potential of 2,285 days and does not go through hydrolysis or photolysis. However, microorganisms play the major role in endothall breakdown. The half-life of endothall in a typical field application, in which microorganisms would be present, is one day to about eight days. Endothall total persistence time is typically 30 to 60 days. High water temperatures decrease total persistence time. Since this chemical breaks down quickly and has a short half-life, water quality standards will only be exceeded for a short time.

Spot treatments typically use concentrations of Triclopyr near the maximum-labeled rates. Studies have shown that those sites see a drop in Triclopyr concentration to drinking water tolerances (0.5 mg a.i./L) generally within one day but could take eight days in areas with low water exchange. Chemical compounds associated with Triclopyr are typically lower (0.1 mg a.i/L) on the application day and dissipate to undetectable levels about three days afterwards (WSDE, 2004). The rapid dissipation to levels below drinking water tolerances indicate that this herbicide will have only short-term effects. In moving water systems, such as in the canals, dissipation times will likely be quicker.

Cumulative Effects
Exposure of living plant tissue to herbicides usually results in secondary effects that may affect the biota. When plants start to die, there is often a drop in the dissolved oxygen content associated with the decay of the dead and dying plant material. Reduction in dissolved oxygen concentration may result in aquatic animal mortality or a shift in the dominant form or diversity of biota (WSDE, 2004; WDSE). There may also be changes in the levels of plant nutrients due to release of phosphate from the decaying plant tissue and anoxic hypolimnion. In addition, ammonia production from the decay of dead and dying plant tissue may reach levels toxic to the resident biota. Ammonia may be further oxidized to nitrite, which is also toxic to fish. The presence of these nutrients may cause an algal bloom to occur (WDSE 2010). In order to mitigate for these potential negative cumulative impacts, application would occur as early in the season as possible to target plants when they are actively growing but biomass levels have not reached maximum levels (i.e. plants are not topped out in the water column). Input of fresh water and dilution into the ponds would also reduce potential build-up of toxic chemicals or depletion of dissolved oxygen helping to mitigate any potential negative cumulative effects.

4.5 Air Quality

4.5.1 Affected Environment

The State of Montana, as well as the Federal EPA, has established standards regarding several air quality contaminants including carbon monoxide, lead, hydrogen sulfide, sulfur dioxide, particulate matter smaller than 10 microns, particulate matter smaller than 2.5 microns, ozone, and nitrogen dioxide. The nearest air quality station is in Lewis and Clark County, north of Canyon Ferry WMA. The station measures carbon monoxide, ozone, sulfur dioxide, and particulate matter, which measurements are all below the set standards.

4.5.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct and Indirect Effects
Under the No Action Alternative, no control efforts would occur for EWM, and consequently there would be no direct or indirect effects to the air quality in the area.

Cumulative Effects
Under the No Action Alternative, no control efforts would occur for EWM, and consequently there would be no cumulative effects to the air quality in the area.

4.5.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects
Aquatic herbicide application used for EWM control is not expected to appreciably effect air quality because of the small size of the areas treated, the amount of herbicide used, the mode of application

(injection or granular compared to boom or aerial applications), and the rapid dilution of herbicides in the air. As such, effects on air quality are not considered significant.

Cumulative Effects
Application would only occur once or potentially twice (Endothall) a year on a small number of acres so cumulative effects on air quality are likely not significant. No local area tolerances of air pollution are expected to be exceeded.

4.6 Sediments
4.6.1 Affected Environment
The areas that will be controlled for EWM are aquatic; therefore, the sediments play a large role in aquatic ecosystem. There is a range of sediment types which are determined by water velocity in the area. Sediment types in aquatic environments include cobble, gravel, sand, or silt.

4.6.2 Environmental Consequences of Alternative 1: No Action Alternative
Direct and Indirect Effects
Under the No Action Alternative, no control of EWM would occur so no changes impacting sediments would occur.

Cumulative Effects
Under the No Action Alternative, no control of EWM would occur so no changes in the sediment would occur. Increased sedimentation due to establishment of dense EWM and reductions in water velocity could change the benthic community with potential cascading effects to aquatic and terrestrial ecosystems.

4.6.3 Environmental Consequences of Alternative 2
The environmental fate of herbicides in sediments may play a role in the potential risk to fish, wildlife, and human health. The chemicals in the preferred alternative are selected because of their short half-lives and their inability to adsorb to soils. As a result, these chemicals should not pose a risk resulting in the maintenance of high-quality sediments for the benthic community.

The half-life of Endothall in aerobic soils with viable microbial populations ranged from less than one week to approximately 30 days (WSDE, 2010). In two field tests, residues were non-detectable after 21 days. When lacking sufficient microbial populations able to degrade endothall, two studies found a half-life of 166 days and persistence of residues over 0.05 mg a.i./L more than one year (WSDE, 2010). It is likely that the canals and/or the ponds contain sufficient microbes to accelerate the degradation process. Due to high water solubility and low soil/water distribution coefficient, dipotassium endothall does not adsorb well to most soils (WSDE 2010).

Triclopyr persistence studies in sediments showed the half- life of triclopyr in the sediment ranged from around one day to six days, and the half-life of triclopyr metabolites were approximately eleven days (WSDE, 2004). Triclopyr does not readily adsorb to soils (WSDE 2004). The low levels of triclopyr in sediment indicate that the sediment quality should remain high in treated water bodies and that such sediments should pose little or no threat to benthic in-fauna (WSDE 2004).

4.7 Wetlands

4.7.1 Affected Environment

The majority of the canals exist outside of any wetland complexes. When the west canal nears Pond 4 it passes through some palustrine wetlands dominated by riparian forests, shrubs, and emergent sites. The three waterfowl ponds which obtain water from the canals typically have palustrine wetlands dominated by shrub and emergent type wetlands though some lacustrine sites may exist in the deeper portions of the ponds.

4.7.2 Alternative 1: No Action Alternative

Under the No Action Alternative, no direct or indirect effects should occur to wetlands in the project area nor should there be a net change in wetland acreage. However, the quality of deeper water wetlands may decrease as biodiversity decreases with increases in EWM populations.

4.7.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Because of how herbicide products are applied, impacts to other wetland environments are unlikely. There may be some flow of water into estuarine, palustrine, riparian, lentic, or lotic environments. However, it is not anticipated that the impact would be measurable due to dilution effects since the treated water quickly dilutes as it flows from the canal into the ponds. The total application of these products should not exceed 2.5 mg a.i./L for the treatment area per annual growing season. Most emergent plants are not likely to be adversely affected at the concentrations of triclopyr used to control aquatic weeds. (WSDE, 2004)

Cumulative Effects

A study comparing the efficacy of bottom barriers versus herbicide applications to control EWM showed that one-year post-treatment, EWM populations in the bottom barrier treated area returned while native plants did not. The area treated with a systemic herbicide showed little regrowth of EWM and excellent colonization of native plants (Helsel et al 1996). Control of EWM will help re-establish desired submerged vegetation within wetland and open water areas. As the chemicals will quickly dissipate, there should be no further cumulative effects from active ingredients affecting the native community.

4.8 Recreation

4.8.1. Affected Environment

Canyon Ferry WMA is a destination location for recreationists to view wildlife, hike, camp, fish, and hunt upland birds, waterfowl, and big game species. As such, it is important to control invasive plants such as EWM. While in the process of controlling those species, it is important to prevent impacts to recreation as little as possible.

4.8.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, there will be no efforts to suppress or control EWM. As such, recreation opportunities could be adversely impacted from decreases in biodiversity. There is also the potential that EWM could be spread into other water bodies including Canyon Ferry Reservoir through human activity.

Cumulative Effects
Any potential increase in EWM infestations, could result in a decrease in recreation opportunities. Reductions in opportunities could have impacts to the local economy through loss of tourism, or increased costs of having to travel further to find the same recreational opportunities.

4.8.3 Environmental Consequences of Alternative 2
Direct and Indirect Effects
The preferred alternative would help improve the overall recreation opportunities within Canyon Ferry WMA. Control of EWM would help prevent spread of the invasive species without closing the area to recreationists which will maintain or enhance recreational opportunity. Short-term closures of the canals during chemical application would occur to protect recreationists. Closures would be less than a day and would not prevent recreationists from using the rest of the management area.

Cumulative Effects
Alternative 2 would help continue to provide the best recreation possible to the people of Montana. Efforts would maintain or enhance recreational opportunities and provide economic benefits to the state and local community.

4.9 Human Health

4.9.1 Affected Environment
Potential pathways for affecting human health include direct herbicide contact to herbicide applicators and direct herbicide contact, inhalation, or ingestion from members of the public that could potentially swim within or drink from treated areas shortly after application. The proposed herbicides quickly become diluted and quickly biodegrade; therefore, the opportunity for the public to be exposed to the herbicide is limited. The project area is a wildlife management area, so there are no sources of drinking water or wells within the project area.

4.9.2 Environmental Consequences of Alternative 1: No Action Alternative
Direct and Indirect Effects
With the No Action Alternative, no herbicide treatment control activities would occur so there would be no direct or indirect effects to human health.

Cumulative Effects
The No Action Alternative would not result in changes to current human health conditions and therefore there would be no cumulative effects to human health.

4.9.3 Environmental Consequences of Alternative 2
Direct and Indirect Effects
The chemicals to be used in Alternative 2 are approved by the EPA and registered in the State of Montana. These herbicides are water-soluble and readily eliminated by humans, so they do not pose a risk of bioaccumulation. The short half-lives of the selected herbicides also reduce potential intake by humans. Research has shown little or no acute risk to human health if used within the manufacturer's specification through all possible exposure vectors (WSDE 2010). Chronic exposure assessments indicate human health should not be adversely impacted from chronic exposure to these chemicals via ingestion of fish, ingestion of surface water, incidental ingestion of sediments, dermal contact with sediments, or

dermal contact with water (swimming) (SCE 2010). The proposed herbicides have been chosen for their sensitivity to human health and the environment.

<u>Triclopyr</u>
The greatest risk is posed to the applicator. All personal protection equipment required by the chemical label will be used to reduce the potential exposure of applicators to the chemicals. Exposure of the public to herbicides at harmful levels is not likely. Eye irritation or over exposure could occur if swimming in Triclopyr treated water. Risk analyses were completed for various populations. The most sensitive population was found to be children who swim for three hours and ingest water while swimming. However, a child would have to ingest 3.5 gallons of lake water where triclopyr had been recently applied to cause risk factors to be exceeded. Based on the label use directions and the results of the triclopyr toxicology studies, the aggregate or combined daily exposure to the chemical from aquatic herbicidal weed control does not pose an adverse health concern (WSDE 2004). To prevent any potential exposure, treatment areas will be posted prior to application, and the public will be made known about applications prior to their occurring. Swimming will not be allowed in treated areas for 12 hours per the manufacturer label.

Concentration of Triclopyr will quickly fall below the drinking water tolerance generally in one day though it could be up to 3 days (Houtman et al 1997) and Triclopyr metabolites typically are not detected on the same day of application (WSDE 2004)

<u>Endothall</u>
Repeated daily or weekly chemical exposures for short time frames typically occur during the application of a chemical or through dietary intake of a treated food crop or water. Most human chemical exposures are either acute (one-time exposure) or sub chronic (exposure to a chemical for a few days or weeks). The potential for sub chronic exposure to endothall would also occur when the chemical is used for aquatic weed control. Such exposures for persons in contact with recently treated water would primarily involve dermal contact with the chemical through swimming, ingesting the water or sediment, or dermal contact with treated sediments and aquatic weeds. (WDSE)

The results of the exposure and risk assessment indicate that a person could swim daily in the treated water and never reach the lowest No Observable Effect Level (NOEL) endothall dose of 2.6 mg/kg/day. As a result, aquatic application of endothall-containing products in compliance with label directions is not expected to result in adverse health effects following contact with treated water. Further, factors mitigating against any adverse health effects from applied endothall are the high-water dilution rate, poor dermal and gut absorption, rapid excretion of absorbed endothall and short half-life in water, all of which support the conclusion that overexposure to the chemical is unlikely (WDSE). An exposure assessment to evaluate swimmers' exposure to endothall treated water was conducted according to EPA's standard operating procedures for swimmer exposure in treated water, which calculated that the daily total dose to a person swimming in water containing 5 mg a.i./L endothall was extremely low and did not present an acute toxicity risk (Lunchick 1994)

Cumulative Effects
The human health cumulative effects associated with the aquatic herbicides used in the proposed action are not expected to result in adverse health effects, if chemicals are utilized properly according to label directions, which they will be. The canals would only have one treatment of triclopyr per year and up to

two treatments of Endothall (possibly one for EWM and a separate one for CLP) per year, and the actual area is quite small. Rapid dilution will reduce potential chronic exposure time.

5 ENVIRONMENTAL ASSESSMENT PREPARATION

5.1 Environmental Impact Statement Determination

After considering the potential impacts of Alternatives 2 and planned mitigation measures to reduce predicted impacts to the physical and human environment, FWP has determined that an Environmental Impact Statement is not warranted. The anticipated negative affects to fisheries, wildlife, vegetation, and the public would be minimized through the season of implementation, public education, appropriate application of herbicide, and natural process of the waterways.

5.2 Document Preparer

Adam Grove, FWP Wildlife Biologist, Townsend MT

5.3 Contributing Agencies, Organizations or Groups

U.S. Bureau of Reclamation, Canyon Ferry Field Office, Helena MT
FWP Fisheries

- Craig McLane – Aquatic Invasive Species Specialist
- Ron Spoon – Fisheries Biologist

FWP Responsive Management Unit

6 PUBLIC PARTICIPATION

6.1 Public involvement

The public will be notified in the following manners to comment on this current EA, the proposed action and alternatives:

- One public notice in each of these papers: Helena Independent Record, Bozeman Chronicle
- Public notice on the Fish, Wildlife & Parks web page: http://fwp.mt.gov.

Copies of this environmental assessment will also be distributed to interested parties to ensure their knowledge of the proposed project.

6.2 Duration of comment period:

The public comment period will extend for (30) thirty days beginning March 19, 2019. Written or electronic comments will be accepted until 5:00 p.m. April 18**, 2019** and can be mailed or emailed to the addresses below:

Attention: Adam Grove
Montana Fish, Wildlife & Parks
P.O. Box 998
Townsend, MT 59644

Email: adgrove@mt.gov

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